COGNITIVE EFFECTS OF THINKING MAPS, SIX THINKING HATS AND TAXONOMY BLOOM ON INDIGENOUS PUPILS

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ABSTRACT

The role of metacognitive skills becomes crucial in current learning process, particularly independent of intelligence. Pupil understands own thinking in the metacognitive process, they aware how their brain process information. The awareness helps them to develop an effective strategy in learning. According to Gardner’s multiple intelligence theory, implementation of metacognitive skills enable student to discover their own intelligence and select the most effective learning method to maximize the learning outcomes.

This is a quantitative research to evaluate the effectiveness of using different thinking tools to enhance pupil’s cognitive level. There are 3 thinking tools in this research, Thinking Maps, Six Thinking Hats and Taxonomy Bloom. This research will focus on the indigenous pupils because they are the at-risk group in the trend of modernization.

KEYWORDS

Metacognition, Thinking Maps, 6 Thinking Hats, Taxonomy Bloom, Indigenous

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Introduction

The roles of thinking skills have become vital in the informative era. Thinking tools help pupils to think systematically and effectively. In the ever changing world, we need to embrace the changes in order to remain competitive in global market. Endeavor to equip pupils with critical and innovative thinking skill is an inevitable action to prepare them survive in the future world (Bransford, Brown Ann & Cocking Rodney, 2000).

Educators implant metacognition strategies in the teaching and learning process. Metacognition enable educator to maximize the effectiveness of learning process. It always has a positive relationship with learner’s intelligent. If we resemble intelligent as a car; metacognition is the skill to drive it. A learner gifted with high intelligent must also equipped with the skill to execute it (Sternberg & Grigorenko, 2004).

Metacognition helps educators to understand learner’s thinking and learning process. This awareness is the core to ensure educator mastered the method of teaching. Many research regarding how thinking can be taught on children to improve their learning. Metacognition is the process of “thinking about thinking”. It helps learner to process information systematically (Flavell, 1979).

Educational gap between indigenous student and mainstream student become wider because most of the educational policies in Malaysia emphasize the benefits of majority population. Cultural differences consequence different needs and perspective toward education. Lack of attention from the policy maker causes indigenous student dropout from the educational system (JAKOA, 2015).

The dropout rate for indigenous student decreased from 26.16% in 2012 to 25% in 2015. Even though there is an improvement in indigenous dropout rate but it is not satisfied because dropout rate for indigenous student is still significantly high compare to mainstream student. Many researches were conducted to investigate the issues but few on the metacognition subject (JAKOA, 2015).

The definition of intelligence is controversial. Psychologists have different interpretations on intelligence. From the “mainstream science on intelligence”, psychologists agreed that intelligence is common mental ability towards the environment. These abilities are including reasoning skills, problem solving skills, abstract thinking, perceiving complicated idea and learning through previous experience (Gottfredson, 1997).
Intelligence does not limit at book learning or narrow academic skills only. It should not be related with the examination scores in school because it is wider and deeper ability to understand our environment. It includes the ability to catch the information, make sense from the information and implement it into daily life (Gottfredson, 1997).

Different culture background influences intelligence of a population. Intelligence refers to the cognitive abilities to adapt to the environment. It always correlates with academic performance, logical thinking, problem solving skills, creative and critical thinking. Culture refers the common idea, custom and social behavior in a society. Culture has significant influence on cognition development and thinking of a population (Vygotsky, 1987).

Indigenous population has unique culture value. The unique culture value influences their perspective towards intelligence and education. Therefore researcher focuses the study on this minority population. The research enables teacher who teach in the indigenous school select the most effective thinking tool for their pupils.

Literature Review

The concept of Higher Order Thinking Skills (HOTS) is implanted in Malaysia educational system. The concept employs more cognitive processing in teaching and learning. The main objective of implementation of HOTS is to encourage pupils think critically and creatively. HOTS is difficult to neither learn nor teach but it brings lifelong benefit for the pupils. Therefore introduction of thinking tools is important for primary school pupils because it equip them to confront with the HOTS education (Nagappan, 2008).

There are many different type of thinking tools to improve metacognitive abilities. Neuropsychology research shows that the thinking maps are the visual of our thinking process. It helps thinker to transform abstract thought to concrete image. This process provides deeper comprehension for thinker (Hyerle, 1996).

Thinking maps was created by researcher David Hyerle in year 1988. It is a set of visual pattern that represent specific thinking process. Pupils will be more conscious about their thought when they have concrete image of their thought. Thinking maps is a common language of thinking in 21st century educational system (Hyerle, 1996).

Thinking maps often use as a tool for cooperative learning. Pupils visualize the abstract thought into concrete image. This will enable peers to
understand thinker thought. Thinking maps helps to build a deeper comprehension among pupils. Pupils benefit from scaffolding process while understanding each other’s thought (Hyerle, 1996).

The six thinking hats created by Edward De Bono in year 1985. It involves six colour hats. Each colour represents a direction of thinking. Each hats is given limited time to be used. In each direction, learner’s cognitive process will consciously think of certain issues. The six directions of thinking are: managing, information, emotion, discernment, optimistic response and creativity (deBono, 1985).

The six thinking hats divide thinking into 6 different dimensions. Each dimension represent by a color symbolic hat. The white hat represents the fact thinking which process the information given in the context. The yellow hat represents optimistic which explore the positivity. The black hat is in charge of the judgmental part. It identifies problem and difficulties (deBono, 1985).

The red hat represents the emotional part of thinking. Thinker can express their emotion when using this hat. The green hat represents creativity. Thinker explores alternatives and possibilities when using this hat. Lastly, the blue hat monitoring the thinking process to ensure thinker follow the six thinking hats guideline (deBono, 1985).

The Bloom’s Taxonomy is another thinking tool that always being used in educational system. It helps to promote higher order thinking such as analyzing and evaluating. Pupils are encouraged to think independently instead of memorizing the facts and rote learning (Bloom, 1994).

The Taxonomy Bloom was created by educational psychologist Dr. Benjamin Bloom in year 1956. It serves the purpose to promote higher order thinking in educational process. There are 6 major categories of cognitive process, remembering, understanding, applying, analyzing, evaluating and creating (Krathwohl, 2002).

Taxonomy Bloom provides a basic sequential model for teacher when teaching a new topic in class. The categories start from the simplest to the hardest. Therefore, it can be taught according to their degree of difficulties. The skills in simple categories must be taught first before proceed to the next categories (Bloom, 1994)

Ministry of Education’s main focus is to provide equal opportunities of quality education for all. The nation’s educational objectives are revealed in
the National Educational Philosophy to develop knowledgeable and skilled individual to encounter the challenges of 21st century. Therefore, endeavor to improve educational system in the indigenous population is very vital to closer gap between the mainstream education in urban area and indigenous education in rural area (JAKOA, 2011).

MOE is taking action to closer the educational gap between indigenous population and non-indigenous population. It is part of the MOE objectives to equip the next generation of indigenous group with appropriate knowledge and skill so that they become valuable assets in 21st century (JAKOA, 2011).

The enrollment of indigenous children in formal school is increasing recently. Unfortunately, the opportunities of education are less compare to other population. Indigenous children have no access to school from their house. Awareness of education among indigenous parent are low, as they afraid losing their children to the outside world (JAKOA, 2011).

Education is the main focus for government to improve life’s quality for the indigenous population. Due to geographical factor, indigenous children are isolated from the mainstream education. They are lack of opportunities to accept formal education (Mohd Tap, 1995).

Modernization and globalization become a serious threat for indigenous population. Hence, indigenous children are classified as at-risk group in this context. Since year 2001, Jabatan Kemajuan Orang Asli (JAKOA) implements a preparation program for indigenous children to enter the formal educational system. Educational researcher also concentrates their focus in indigenous educational issue (JAKOA, 2011).

**Methodology**

This study is an experimental research. The Thinking Maps, Six Thinking Hats, Taxonomy Bloom will be the interventions implement among the indigenous children. Researcher will establish a cause and effect relationship among. It evaluates the effectiveness of 3 new interventions towards the indigenous group.

The experimental research is static group pretest-posttest design. Researcher selects 100 year 1 pupils randomly from 4 schools in Carey Island. The samples are made up from 50 female and 50 male pupils from the indigenous population only. Samples are chosen base on the average performance in school. It is important to exclude student with special needs or non-indigenous pupils. Both categories may bring significant influences in the research findings. It may influence the generality of research too.
The samples will be divided into 4 groups. Group A will learn to use thinking maps. Group B will learn to use six thinking hats. Group C will learn to use Taxonomy Bloom. Group D will serve as control group in this research. Pretest will be conduct in every group to assess pupils’ cognitive level.

The new interventions will only implement in the experimental groups whereas the control group will remain same teaching and learning method. After 6 months of implement the interventions in the experimental group, posttest will be conduct to assess cognitive level among experimental groups and control group.

McCarthy Scale of Children Abilities (MSCA) will serve as a measurement tool to assess samples’ cognitive level. MSCA is used because the scale is testing on children cognitive level rather than their intelligent. Therefore, interpretation of the test not enters the sometimes excoriating debates regarding intelligence, genetics, lifelong proclivity, etc. (Picone, Regine, & Ribaudo, 2001).

This is a quantitative research, scores of MSCA will be used during data analyzing. Sample’s pretest scores are subtracted from the posttest score to find the differences. Comparison among 4 groups will be conducted to identify which thinking tool is more suitable for the indigenous population.

**Conclusion**

Researcher aware metacognitive skills playing an important role in early learning process especially primary education. It improves pupils learning outcomes. Therefore educator needs to select the most suitable thinking strategy for pupils (Baker, 2008).

This research will help pupils to aware of their own thinking and discover their learning problem. It is an important step to solve learning problem in early stage so that pupils who fall behind will be given remedial coaching until they catch up. This research can be conduct in variety of circumstance for demographic comparison such as gender, racial and social economic status (Baker, 2008).

Based on the methodology used, researchers can conduct research with a more structured and systematic. The methodology of this study can also ensure that the study is progressing to meet the objectives and provide guidance to researchers about the procedures implementing the study (Neuman, 1999).

This research provides awareness of the effectiveness of different thinking tool to improve pupil’s cognitive abilities which are verbal abilities, perceptual performance, quantitative and memory. Suggestion can be invented
by reviewing this study to enhance student’s abilities during teaching and learning session.

The research should be conducted soon because it provides urgent information for indigenous educator to select the most effective thinking strategy for the pupils. In the future research, researcher initiates to generalize the study to different minority population in order to optimize the advantage of thinking tools for all pupils in the nation.

**Disclosure statement**

No potential conflict of interest was reported by the authors.

**Notes on contributors**

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